

WHAT IS CLAIMED IS:

1. A cooling apparatus, comprising a needle that defines an interior chamber; and an infusion sleeve that is hollow and elongated between proximal and distal ends, the infusion sleeve being made of a flexible material and being collapsible and expandable axially while the needle is repetitively partially withdrawn and advanced, the needle extending within confines of the infusion sleeve and having a tip that projects outwardly beyond the distal end of the infusion sleeve, the infusion sleeve having an interior surface and the needle having an exterior surface between which is defined a passage for fluid flow, the distal end of the infusion sleeve having peak and valley formations, the valley formations being arranged closer to the proximal end of the infusion sleeve than are the peak formations, the valley formations being configured to permit fluid flow across the valley formations after the fluid flows through the passage in a direction from the proximal end to the distal end of the infusion sleeve to flow across the valley formations.
2. The cooling apparatus of claim 1, wherein the distal end is serrated or scalloped to define the peak and valley formations.
3. The cooling apparatus of claim 1, wherein an infusion source is in fluid communication with the passage and a source of suction is in fluid communication with the interior channel of the needle.

4. The cooling apparatus of claim 1, further comprising a driver of the needle and a control that is configured to direct the driver to drive the needle without manual intervention to move axially relative to the infusion sleeve by a distance back and forth that is greater than that which the needle would ordinarily travel.

5. A method of cooling, comprising extending a needle within confines of an infusion sleeve that is hollow and projecting a tip of the needle outwardly beyond a distal end of the infusion sleeve, defining a passage between an interior surface of the infusion sleeve and an exterior surface of the needle, arranging valley formations of the distal end of the infusion sleeve closer to a proximal end of the infusion sleeve than are peak formations of the distal end of the infusion sleeve, and flowing fluid through the passage to the distal end of the infusion sleeve and away from the proximal end of the infusion sleeve to thereafter flow across the valley formations, the needle defining an interior chamber; and the infusion sleeve being elongated between the proximal and distal ends and being made of a flexible material that is collapsible and expandable axially as the needle is repetitively partially withdrawn and advanced.

6. The method of claim 5, further comprising providing the distal end of the infusion sleeve with serrations or scallops to form the peak and valley formations.

7. The method of claim 6, further comprising preventing an impediment to the flow of the fluid with the serrations or scallops at the distal end of the infusion sleeve.

8. The method of claim 5, further comprising creating suction through the needle while the fluid flows to cool the needle.

9. The method of claim 5, wherein configuring the infusion source to be in fluid communication with the passage and arranging a source of suction in fluid communication with the interior channel of the needle.

10. The method of claim 5, further comprising repetitively expanding and collapsing the infusion sleeve as the needle repetitively advances and partially withdraws.

11. A method of preparing to cool, comprising:

extending a needle within confines of an infusion sleeve that is hollow and projecting a tip of the needle outwardly beyond a distal end of the infusion sleeve, defining a passage between an interior surface of the infusion sleeve and an exterior surface of the needle, arranging valley formations of the distal end of the infusion sleeve closer to a proximal end of the infusion sleeve than are peak formations of the distal end of the infusion sleeve, and abutting an exterior of an incision with the peak formations of the infusion sleeve so that flowing fluid through the passage to the distal end of the infusion sleeve and away from the proximal end results in the fluid thereafter flowing across the valley formations, the needle defining an interior chamber; and the infusion sleeve being elongated between the proximal and distal ends and being made of a flexible material that is collapsible and expandable axially while the needle is repetitively partially withdrawn and advanced.

12. The method of claim 11, further comprising providing the distal end of the infusion sleeve with serrations or scallops to form the peak and valley formations.

13. The method of claim 12, further comprising preventing an impediment to the flow of the fluid with the serrations or scallops at the distal end of the infusion sleeve.

14. The method of claim 11, further comprising creating suction through the needle while the fluid flows to cool the needle.

15. The method of claim 11, wherein configuring the infusion source to be in fluid communication with the passage and arranging a source of suction in fluid communication with the interior channel of the needle.

16. The method of claim 11, wherein the fluid flow is across the valley formations but without flowing across the peak formations because of the abutting.